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Pink Grasshoppers.

By SAMUEL H. SCUDDER, Cambridge, Mass.

See plate VI.

The insects commonly called grasshoppers by English speaking peoples are separated by naturalists into two great families, in one of which the antennæ are much shorter than the body and moderately thick, while in the other they are longer, often very much longer, than the body, and are exceedingly slender, tapering and thread like.

The former are generally found on the ground and as a rule are of some brown color, while the latter, at least when winged, are commonly confined to trees and bushes and are usually green. There are, however, many exceptions both as to habitat and color. The long-horned or green grasshoppers are usually green throughout, or with the exception of some minute and inconspicuous spots or streaks; but many species exist in two forms, one of which is grass-green, while the other is dead-leaf-brown, there being no difference between them, except in the general tint.

It is to this group of grasshoppers that belong all the noisy tribes of Orthoptera (excepting only the crickets), of which the

katydid is an example, and which stridulate by rubbing together the bases of the fore wings, provided for the purpose with a sort of tambourine, a tense thin membrane stiffened by cross ribs; all these songsters are males, the wings of the females being unprovided with the apparatus necessary to produce a sound. The short-horned grasshoppers stridulate but feebly, and generally by scraping their fore wings with the hind thighs—fiddle fashion.

Very rarely—it has been recorded less than a dozen times—one of these long-horned grasshoppers is found of a violet or pink color instead of green or brown. It occurs only as a rare "sport." A pair of these, belonging to the species known as *Amblycorypha oblongifolia*, are figured on our plate, painted from life, as they were feeding on the flowers of golden rod, which they devour with great zest.

The female with its sabre-like ovipositor is shown above, the male below. The female is of a pale coral red verging on magenta, the abdomen a shade paler, while the male is of an orange red. The tegmina or fore wings of the female are of a very clear color, with scarcely a single fleck of brown, while those of the male are much dotted with brown (at least as compared with what we ordinarily find in this genus) and flecked longitudinally with yellow, while the stridulating field, the tambourine, is almost entirely dull brown, and an obscure patch of the same color, more distinct on one wing than on the other, appears beyond the middle. In both, the palpi are of the color of the body, but the eyes are green and the antennæ luteous, as in normal examples.

This pair of pink grasshoppers was captured at Woods Holl, Mass., at the end of August, 1886, and other specimens were taken during the same month, one so early as the ninth of August. The first example of the sort that I ever saw was a female of another species of the same genus, *Amblycorpyha rotundifolia*, taken on Sharp Mt., Pennsylvania, at the end of August, 1878, and sent me by the late Dr. Joseph Leidy. Riley, however, records a pink specimen of *A. oblongifolia* in his Sixth Missouri Report (p. 169), and Johnson speaks of another in Science for 1889, p. 32.

Brunner, in his monograph of the subfamily Phaneropterinæ, to which these grasshoppers belong, gives instances of similar sports in other members of the same group, but I cannot learn that the phenomenon is known in Europe, which, however, possesses very few species of Phaneropterinæ, excepting such as are short winged, in which it could not appear to such advantage; but the phenomenon is not wholly confined to this group, since an example of it has been found in the true katydid, *Cyrtophyllus perspicillatus*, belonging to a distinct subfamily, Pseudophyllinæ, taken at Point Pleasant, New Jersey, 1883, as reported in the proceedings of the Philadelphia Academy by Lewis; and a species allied to it was named *rosaceus* by Stal, on account of the color of the wings in a specimen seen by him from Central America. The Pseudophyllinæ are not found in Europe.

I have never heard of this phenomenon in any other subfamily, such, for instance, as the Conocephalinæ, where we sometimes find dichromatism—green and brown varieties.

The causes which produce this curious sport among green grasshoppers are wholly unknown. The specimens I saw alive appeared quite healthy and acted in a normal manner. One thinks at once of autumn leaves and their change from green to red, and notices that these grasshopper cases all occur in the autumn, so far as known; but then it is only in the autumn that these insects mature and have their wings, and one of those taken at Woods Holl was found as early as August 9th. Even to the end of August, all residents at Woods Holl in 1886 insisted upon it that they had had no temperature at all approaching the freezing point; and finally what are we to say to Stal's *rosaceus*, taken at Chiriqui in Costa Rica? I leave these questions to the physiologists.

Preservation of Colors in Dragonflies (Odonata).

By E. B. Williamson.

The following note is offered more as a suggestion than as a statement of any positive results. The experiments were tried with only one species, *Enallagma civile*. At the time I was

unable to obtain other desirable species in numbers sufficient to test the methods. I would suggest that similar experiments on some species of *Sympetrum* and some *Æschna* or *Anax* might yield something of interest in the way of color preservation.

More than two hundred males of *Enallagma civile* were caught one forenoon, and the following conclusions result from treating these specimens in various ways. Mr. D. A. Atkinson, of Pittsburg, has had good results in the preservation of herpetological material by thoroughly hardening in formalin solution and then using a solution of zinc sulphate ($ZnSO_4$, 1 pound; H_2O, 3 gals.) for the permanent preserving fluid. This will not do, however, for dragonflies. Thoroughly hardened in 95 per cent. alcohol or 6 per cent. formalin and then placed in zinc sulphate solution they slowly blackened and spoiled. They spoiled more rapidly if placed in the zinc sulphate without previous hardening. Specimens preserved in 6 per cent. formalin, in a few days turned dark obscure reddish. Formalin is, at the best, an unsafe permanent preservative for material of any kind. In glass stoppered jars, sealed with vaseline, it disappears, not, as often stated, by evaporation, but by decomposition. It is valuable in fixing the colors of fishes, salamanders, etc., but even in strong solution does not seem able to set the colors of *Enallagmas*.

Specimens were placed in 95 per cent. alcohol. In this, colors are natural after three months. Specimens were papered after being in alcohol eight days. Color preservation good, shrinkage bad. Specimens papered after one month in alcohol did not shrink any more than those of eight days, but there was some whitening of postocular spots and blue of thorax. Specimens were papered after four hours in benzine. Color preservation good, but the blue of thorax took on a slight violet tinge. After a few hours in benzine specimens soften and the abdominal segments fall apart easily. Specimens hardened in alcohol, then placed two days in benzine, and finally papered had the colors almost perfectly preserved, but with the hint of a white line on either side of the black mid-dorsal stripe. Specimens placed four hours in acetone and then papered also had the colors well preserved, but

with some whitening anteriorly of the antehumeral blue line. Specimens placed in acetone are hardened and do not soften and break up as in benzine. Specimens previously hardened in alcohol do not soften in benzine. Specimens were placed four hours in acetone, eight hours in benzine, and papered. There was no shrinking or breaking, and color preservation was good with the exception of some whitening of the postocular spots and the blue of the thorax. This last method I am especially anxious to see tried with some of the larger species mentioned above. Discoloration of specimens which are allowed to dry without any treatment seems to be due to putrefaction in the course of drying, and later the possible spread of oily matter from the ovaries or alimentary tract. Acetone is miscible in both water and benzine. Specimens taken from the cyanide bottle and placed in it sink at once. A few hours should suffice to replace all the watery fluids of the insects by acetone. Transferred to benzine, the acetone is replaced by benzine, and the fats are dissolved. Taken from benzine the specimens dry almost at once; and the water and fats are thus removed within a few hours. All the specimens treated with alcohol, benzine and acetone, and then papered, were subsequently relaxed in the ordinary way. Hardening by the chemicals did not interfere with pinning and spreading the specimens of this small species for the cabinet.

Notes on Cychrus, with the Description of a New Species.

By J. L. WEBB, Pullman, Washington.

Cychrus idahoensis n. sp.—Black, with indistinct bronze lustre; form elongate, rather convex, head moderately elongate, smooth, shining; genæ incised; thorax cordate, slightly wider than long, sides arcuate, oblique posteriorly, with little or no sinuation; pronotum feebly convex, hind angles slightly obtuse; median longitudinal line with the two anterior lines running cephalo-laterad from it, sharply defined; basal impression moderate; lateral longitudinal impressions well defined at base, very faint or obsolete at middle; elytra oval, convex, more attenuate behind than in front, the margins narrowly reflexed, with no trace of green or gold coloring; surface 11 striate, striæ more or less interrupted by the

interspaces running together, especially toward the margins and posteriorly; body beneath smooth and shining. Length 11.5–13.3 mm.

Male with joints 1–3 of anterior tarsi spongy pubescent beneath.

This species is related to *C. marginatus* Fisch., which it closely resembles in form. It presents, however, the following differences from that species, viz: pronotum less suddenly narrowed behind with less evidence of sinuation, having the two lateral longitudinal lines less well defined; margins narrower and less strongly reflexed; the elytra are slightly more convex with narrower margins, the latter having no trace of green or gold coloring; the striæ are interrupted by the interspaces running together forming lacunæ, rather than the interspaces being interrupted by punctuation; 11 specimens collected by myself on Cedar Mountain, Latah County, Idaho, and 3 at Collins, Idaho, 8 males and 6 females.

The types are deposited in the collection of the Washington Agricultural College, and duplicates will be sent to the National Museum and American Entomological Society.

During the past two or three years I have collected quite a number of specimens of *Cychrus relictus* and *regularis* on Cedar Mountain, Idaho. *C. relictus* has also been collected at Spokane and Pullman, and *C. regularis* at Wawawai, Washington, by Prof. C. V. Piper.

Relictus was described by Dr. Horn from a single male specimen collected at Spokane, Washington, by Mr. Ricksecker (Trans. Am. Ent. Soc., vol. ix, p. 188).

Regularis was described from a single pair also collected by Mr. Ricksecker in the Cœur d'Aléne Mountains, Idaho (Tr. Am. Ent. Soc., vol. xii, p. 2). In his description of this species LeConte says:

"Black, not very shining, of the same form and sculpture as *C. relictus*, except on the elytra, which have twelve perfectly regular and entire impressed punctured striæ; the 13th is composed of separate punctures confused with the marginal ones; the interspaces are somewhat wider than the striæ, the 4th and 8th are interrupted by only 3 or 4 punctures."

I have made a close examination of a number of specimens of *regularis*, and I find apparently all gradations between *regularis* and *relictus*. I have four specimens of *relictus* from Spokane, the type locality of this species, and have examined 51

specimens of *regularis*, but give here a description of the variations from the typical form of only 10. The specimens are numbered consecutively, and are otherwise typical.

1. Right elytron with six interruptions on the 8th interval.

2. Right elytron with five interruptions on 4th interval and six on 8th; left with seven on 8th and two on 9th.

3. Right elytron with 9th stria interrupted, left with 12th interval but once.

4. Punctures on 4th and 8th intervals very faint.

5. Right elytron having 7th and 9th intervals interrupted once, left having 4th and 5th striæ run together and confused.

6. Right elytron having 4th and 8th intervals with very faint indication of interruptions, left having 4th interval not entirely interrupted in any one place and 8th with only faint indication.

7. Left elytron without interruption on 4th interval; striæ on both elytra toward the margins confused.

8. Left elytron with eight interruptions on 8th interval; right with seven on 4th, and eight on 8th; 6th interval wavy and punctured.

9. Right elytron with five interruptions on 4th interval, seven on 8th, and four on 11th, 9th and 10th run together in some places; left with six on 4th, and having striæ somewhat confused toward the margin and posteriorly.

10. Right elytron with six interruptions on 4th interval, seven on 8th, and three on 11th; left with six on 4th, eight on 8th, and one on 11th.

Also, the Spokane specimens of *relictus* show some tendency toward regular striation on the elytra, two or three striæ on one or two specimens being moderately straight.

One specimen from Cedar Mountain shows the characters of both species to such an extent that it is impossible to say definitely whether it is *relictus* or *regularis*.

This shows quite clearly that the differences between *relictus* and *regularis* are not so constant as the types seemed to show.

It appears to me, after making an extended examination, that in extreme *regularis* the interspaces between the striæ have their sides perfectly smooth and straight, and that in the

specimens which seem to be intermediate between *regularis* and *relictus*, the interspaces become more and more wavy, uutil the striæ are no longer regular and entire, but broken up as in *relictus*.

The following might be suggested as a revised description of *regularis:* Form and general appearance of *C. relictus*, except on the elytra which have 12 impressed punctured striæ, generally regular and entire. The thirteenth is composed of separate punctures confused with the marginal ones; interspaces somewhat wider than the striæ, the fourth and eighth being generally interrupted by from four to eight punctures, and one or two interruptions occasionally occurring on one or more of the other interspaces, especially on the 7th, 9th and 11th.

A New Method for Permanently Mounting Insects.

By Prof. O. B. JOHNSON, Seattle, Wash.

To the Brethren of the Net!

Just a few words about a new method of permanent mounting for insects that I have been experimenting with and that seems valuable. It consists of a box or case made in two parts with pasteboard sides or rim, and with top and bottom of glass. These glasses are both of the same size, the bottom one fitting flush with the outside of the rim, while the top one fits inside the cover rim, so that the two parts "telescope" together. These cases are ½ inch deep inside, and of sizes increasing in length by inches from 3 to 12, and in width by ¼ inches from 1½ to any width desired. These sizes are easily fitted into 12 or 18 inch drawers of ¾ or 1 inch depth—thus in the 12 it takes 1, 12; 2, 6^s; 3, 4^s; 4, 3^s or 9 + 3, 8 + 4, 7 + 5. The insects are mounted in the conventional position, ♂ + ♀ side by side in the same case on a short piece of oo pin inserted in the usual manner into the thorax, only from the underside. This pin in turn is inserted into a bit of cork that is finally fastened to the bottom glass by a touch of Le Page glue. These cases can be made by any box factory, just what the cost would be will depend upon the place,

I suppose, or collectors can make them themselves, which I do, but I have more time than most folks, being confined to the house. Well, after having the case, to mount the insect, first relax thoroughly, then expand upside down on the ordinary setting board, only made perfectly horizontal, in the usual manner. When dry place them still upside down on a strip of smooth cork, and after extracting the pin from the thorax, used in setting, replace it with a piece cut from an o or oo pin ½ inch long dipped in mucilage, being careful not to let it project clear through, and also to have it stand vertical in drying, during which it is well to replace the glass weights used in expanding over the wings. Now take a sheet of ⅛ inch fine quality cork and cut cubes ⅛ inch, thrust a setting needle through one side, and with a very sharp knife slope off the corners diagonally, making a cone shape with a hole through, into this hole press the outher end of the short pin, now well dried; first dipping it in mucilage. Now place the specimen, still upside down, in the bottom portion of the case, and with a strip of glass long enough to reach across the sides, adjust the cork by sliding it up and down on the pin until it will just touch the underside of the glass, of course, if the pin touches the glass it must be cut down before adjusting the cork, which if the pin was vertical and the hole through the cork perpendicular with the surface, it will now touch evenly, if not, must be trimmmed with the knife until it does. This having been done to the pair, place them as you wish them to appear, still upside down, on any smoth and level surface, clean the inside of the bottom glass thoroughly, touch a very small bit of the glue with a setting needle to the bits of cork and invert the box, dropping it gently down until the glue touches. If all has been done correctly it will rest evenly all around the edge and the specimen will not be displaced; if so, let it dry an hour, clean the cover glass, "telescope" it on, label and put away and your mount will have these advantages.

1st. The conventional position ♂ and ♀ side by side is retained.

2nd. The insect is held entirely by one pin in the thorax as usual.

3rd. All of the essential and desirable features of the "block system" obtained, thus avoiding the tedious repinning for accessions.

4th. The nonecessity for a double series of each species to exhibit the underside, every example is available by simply turning over the case.

5th. All dangers of moisture, drafts, coughing, sleeves, pencil points, dropping eye-glasses, dust, and insects are avoided.

6th. Labels and data are inseparable from the insects, especially desirable in types.

7th. Easily examined with a hand lens above and below.

8th. Material can be passed around during a lecture or meeting without fear of injury, or loaned to your friend and fellow enthusiast, the kindergarten teacher or otherwise made to serve a much wider field—for if a collection is not educational it is senseless.

9th. As to the cost each one can figure that out for their own locality and condition, and if I have omitted anything I will cheerfully answer all inquires.

O. B. JOHNSON, 610 Pike Street, Seattle, Wash.

Letters from Thomas Say to John F. Melsheimer, 1816-1825.—III.

Philad^{a} July 30th 1816

Dear Sir

I have sent you p^{r} James Griffith, Baltimore the following Insects that I hope may meet your acceptance, it is true their number is very limited but they may possibly interest you being foreigners—the names of some of them may be wrong as I have not the chance of reference to many books, if they are so please to correct me——

Scarabæus Lin. *Molossus—Pithecius—Indicus* & *Cinctus* of India *Tityus* of Maryland—*Curculio Imperialis—Splendens* of South America & *Squamulosus* of India—*Buprestis vittata* of India—*Elater noctilucus* of Jamaica (this insect was presented to me alive, its light was very vivid) I cannot determine the species of *Chrysomela* of South America *Meloe* (Mylabris) *Bifas-*

ciata—*Gryllus roseus*-India—*Tettigonia atrata*-India (I do not think that our common noisy Tettigonia has ever been described, it cannot certainly be the *Tibicen*, its very obvious distinctive characteristic, the white spots could not have been overlooked) *Cimex Sinensis* of India *Cimex* (scutellera Latr Tetyra Fab) *Stockerus* of India—*Fulgora Candelaria* India *Nepa Fusca* of India —*Papilio*—*Almana* & Nos 2. 3. 4. India *Argante*—*Sara*—*Phyllis* & No 1. South America—Orithya Leucothoë—India *Libellula Ferrugenia*—of India—*Vespa bicolour. Cincta* India the names of those alluded to by the above numbers, I could not ascertain by Lin's short descriptions as translated by Turton, the only general work on Entom^y. I have in my possession—probably you may know them—*Dytiscus limbatus* of India, I have not seen the American species, but should much doubt from some circumstances of their being the same, but you can now determine by comparison——

I do not see the necessity of removing 294 from the *Ips*, its characters for the most part seem to agree pretty well with that genus ; at any rate I hardly think it can be placed with the G. *Triplax* inasmuch as the Palpi are not hatchet shaped——

In examining those I have of the *Ips*, I found that 291 differed considerably in its generic characters from the others, I allude more particularly to its Palpi, perhaps it would be more correct to place it in the genus *Erotylus* of Latr., though it may bear considerable affinity with *Tritoma* & *Triplax*.

The Insect 708 does not appear to me to be altogether at home in the Genus *Clerus*—I think it ought to be transplanted in company with N^os 116 & 117 to Latreilles Genus *Necrobia*—is 708 found on dead animals?

One of the characters of *Anobium Pertinax* is "Elytra with 8 striæ of minute excavated punctures"—N^o 164 has 10 striæ on the Elytra besides an abbreviated one each side the scutel, taking this differece into consideration with your observations on the thorax & magnitude of our Insect when compared with *Pertinax* I perfectly agree with you as to the necessity of adapting a new name to our insect——

With the Genus *Hyphydrus* I am totally unacquainted, but the *Dytiscus maculatus* of your catalogue most certainly belongs

to the Genus *Haliplus* of Latreile it is so strongly characterized as not to be mistaken—These two Genera Hyphydrus & Haliplus perhaps are the same but of different Authors?

I have not been so fortunate as to obtain another specimen of the Diopsis though I have hunted faithfully, it appears to be a rare insect, and I have no doubt different from Illiger's insect the description of which you were so good as to extract for me; yet like that it may be characterised "Nigra, alis fascia &c" but in the details it appears to differ—I have thought to name it *brevicornis* as the peduncles of the eyes are not longer than the distance between their bases, they are brown—head, posterior spines, & feet pale yellow—poisers white, Thorax brownish black, lateral spines & abdomen black—Fore thighs very much thickened & with the shanks brown but the joints are pale yellow—its length is 2 lines—I found it on the Swamp Cabbage (Pothos fœtida)—May——

When I had the pleasure to be at your house, amongst the very interesting insects you shewed me one (of which you had several specimens) that you thought was a new genus—it is an elongated cylindrical insect—that which I take to be the male is black, with a reddish thorax and black dorsal stripe—(Linné would have placed it with Tenebrio) In looking over a neglected draw[er] in my cabinet today I found a couple of specimens of it & upon examining them but without discection, I concluded that it approached nearest to the Genus *Languria* of Latreille & might be placed there but for its palpi which are not filiform,—Elytra very dark green approaching black—general colour of the female rather lighter.

On the lid of the box within you will find two plates of Insects intended for my American Entomology they are all to be coloured—I send you the plate of G. *Tityus* as the first one that I have had coloured you will therefore not criticise it with too much severity as the artist is young & will improve I have the satisfaction to see in this first attempt that the thing is practicable in this country, which has been heretofore much doubted—The plate of Papilio Philenor will exhibit the style of engraving which however is entirely obscured by the colour when it is laid on & therefor need not be very fine its principle

service seems to be to direct the colourers I intend to send you an impression of each plate coll^{d} is they are produced——

I have a great many remarks to make on Insects in my possession either rec^{d} from your Father or of my own collection with which I shall trouble you in future communications in the mean time those contained in this letter are respectfully submitted to your consideration and decision

I remain Affectionately
Your Obdt Servt
Thomas Say

N. B. I had forgotten to say that there is also in the box a Cicindela which as it is not found in the immediate vicinity of this City I thought it might be rare with you—I found it in great plenty on the sea shore two or three years ago & have met with it in sandy parts of the Jerseys——

T. S.

I cannot see Latreille's reason for altering the Fabrician Genus Geotrupes it appears according to him that the true Fabrician Scarabæi such as your 14, 15, 16 are Geotrupes—& of the Fabrician Geotrupes he makes Scarabæi, is this owing to caprice, or is it to puzzle the student, I feel strongly inclined to adhere in this instance to Fab :——

I would thank you to let me know the title of the book in which Professor Knock[1] describes all those Insects marked K in your Catalogue——

Over the Range in a Wagon.

By Prof. and Mrs. A. J. Snyder.

(Continued from page 113, Vol. XII.)

On the way down from the Pass the insect fauna soon changed. We saw more large *Argynnis*, *Colias* and *Lycæna*. The road lay through almost interminable pine forests, and gradually descended until finally we came out into Middle Park. This portion of country for a few miles was park-like, but of the remainder the name seemed a misnomer. After passing "Idlewild," where we saw fine skins of a mountain lion and a huge bear, we passed Fraser P. O. and store, and then the road for

[1] Knoch.—W. J. F.

two or three miles lay between fine hay ranches. Fortunately, we had made the acquaintance of a teamster at the cabin near the Pass, and when we entered the Park he met us and told us where to find good fishing grounds. Some four or five miles within the Park we came again to hilly country and soon turned from the main road into a lane, and after a mile or two of indescribable roads interspered with bridges that no eastern horse would step upon, we came to the banks of the Fraser River. Here we camped in the midst of such excellent pasture land and amidst scenery of such surpassing beauty, that we forgave the roads, bridges and everything else that had been unpleasant. Along the road we saw *Parnassius smintheus*, *Satyrus charon*, *Cœnonympha* and several *Pieris*. We were in camp early and prepared reels and rods for a try at the trout, but they were too shy to make our acquaintance. A friendly rancher, however, supplied us with enough for supper and gave us hints sufficient to enable us to catch some of the speckled beauties the next day. All through Middle Park and to the northwest the fishing is good at all times and the catching excellent—when the contrary trout will bite. We never had many in camp at one time but often all we could eat. The one bait which they could seldom resist was a live grasshopper, and we soon fell into the habit of collecting hoppers while hunting, and confining them in brass shotgun cartridges by placing a wad over them until needed. Few insects were to be found near our camp here. *Arg. eurynome*, *P. smintheus*, *Pam. sylvanoides* and *Cœnonympha* were fairly common and a roving *Plusia* could be taken now and then. Even at this date it was becoming so dry that insects were scarce.

July 21st, we left Fraser River and took the stage road to Coulter. Just before reaching this post-office we saw the first covey of grouse. It was near this place that the only sage hen observed during the trip was seen skulking into the sage brush. *Satyrus charon* and *Lycæna heteronea* were abundant. Will. caught a beautiful abberration of *P. smintheus*, and we saw a few *Argynnis*. The high altitude had been too much for the youngest of the party, so we omitted an intended side trip to Grand Lake, and hurried on to Sulphur Springs and the only doctor for miles around. Merely stopping in town long enough

for medicine, we proceeded on our way through the canon of the Grand in search of a good camping ground. This canon is very beautiful but unpleasantly dangerous to one unused to wild roads. The single narrow wagon road winds along at the base of mountains which are almost or quite perpendicular, while immediately below, on the other side, roar and tumble the green waters of the Grand River. It is over three miles in length, and until one becomes used to its wildness there is more of fear than pleasure in such a ride. Here we met a team on a spot too narrow to permit a very safe passage. It was necessary to lift one wagon over against the mountain and then hold the other steady while its team crawled past. We found one of the exciting experiences of mountain travel to be the watching for places wide enough for teams to pass and the exercising of such care that we would not be caught in a narrow place. Usually, one constituted himself a forerunner and signalled back when another team was found approaching.

We were relieved when we were out of the canon in safety, and as darkness was coming on rapidly we hastily selected a place for a camp and arranged things for the night. Here we spent a week awaiting the arrival of friends who were expected to join the party but who failed to meet us. Gooseberries were along the river and were as delicious as cultivated ones, either in pies or stewed. The grouse frequently came for the grouse berries which were plentiful. The trout would bite at times—always enough to encourage us to keep on trying—and many birds came to the trees, while the taxidermist found trapping for small rodents not unprofitable. In the sage brush *Pseudohazis hera* were flitting, but hard to catch, and on the mountains above us were many *Melitæa minuta* and *Hipparchia dionysius*. But here, as on the Fraser, the drouth seemed to have very materially lessened the insect life. Almost daily clouds and winds would arise about 1 o'clock and almost carry away tent and provisions, while it blew sand and dust into our eatables. In spite of all, however, *Satyrus charon* was everywhere so abundantly omnipresent that it fairly became tiresome to see it and seldom another species. During a walk to Sulphur Springs, in hope of receiving mail, a few good specimens were taken, among them *Chrysophanus virginiensis*.

July 27th we began preparations to leave camp on the Grand, and on the morning of the 28th were "hitting the trail" shortly after seven o'clock, and along a good road. For some miles we followed the general course of the Grand, more frequently than otherwise being compelled to turn out and climb some steep hill because some rancher must have all the grass land near the stream and also wanted all the land the law would allow; so had also fenced in a few hundred acres of sage brush and barren land that could never be of any possible use to him. We were frequently annoyed by the necessity of traveling miles around such an enclosure when to have permitted a wagon road near the edge of the stream would not have injured the rancher's usable land. One is surprised to find that every foot of land in this and most sections of Colorado visited, except in Routt, Co., seems to have been preempted; provided, always, that there is a possibility of irrigating without any serious effort.

Most of this day's drive was through the everlasting sage brush, Troublesome is the first village on the way and there we found ten houses including barns and one post-office. From this station to Kremmling the country varies little, but there are some beautiful hay ranches along the river. Beyond Kremmling one enters almost at once the foot-hills of the Gores Range, leaves the Grand on the left and enters a desert of alkali with sage brush and grease-wood. Toward evening we came to a little ranch up in the mountains, an Eden in the wilderness, seemingly, where a rancher had utilized the water from several springs to such advantage that he had an excellent garden and an abundance of hay. Here we bought hay and went into camp for Sunday. Along the road from Kremmling, *Cleome* was abundant, and always on its blossoms were numerous *Pamphila*. Few other insects were seen, except now and then a white *Pseudohazis* flitting through the sage too warily to be taken.

It was during this day's drive that we stopped the team while Will attempted to shoot a rare bird. The gun snapped several times but no report followed. On his return to the wagon we wondered why our shot gun, never known to miss fire before, should have failed him; until he finally acknow-

ledged that he had been attempting to shoot one of the sheels that we had loaded with grasshoppers to use as bait for trout.

The ranch near which we camped is the old Jones Ranch, now owned by a Mr. Draper, who, by combining several occupations, is able to make a good living in the midst of a desert. Living with Mr. Draper at this ranch was a most interesting personage, Mr. A. J. Reynolds. Mr. Reynolds is almost entirely deaf, so that it was difficult to question him; but once started, it was easy for him to relate anecdote after anecdote concerning frontier life in the Northwest. We gained many facts concerning his life, including a romance that would well serve as the basis of a thrilling story of life in the West in early days. Suffice it here to say that Mr. Reyolds never married but became a wanderer in that vast wilderness and played a noble part in its preparation for civilized life. He came into the Northwest in '43 with the first emigrant train that crossed with wagons to Oregon. This was shortly after Dr. Marcus Whitman crossed the plains, and he helped to bury Dr. Whitman and Mrs. Whitman in '47. He was one of the party that pursued the Indians who had taken all the other women prisoners; helped recapture them and killed one of the leading chiefs. All the following winter he and sixty others fought the Indians and came near starving to death, for most of the time there was nothing but horse flesh to eat.

The Indian story of the cause of the murdering of Dr. and Mrs. Whitman is that the whites gave the Indians the measles. The Indian method of curing disease was to steam themselves over heated stones placed in water, then to jump immediately into cold river water. When those afflicted with the measles tried this remedy they died, and a priest told them that the medicine that Dr. Whitman gave them was poisoning them, then they killed Dr. and Mrs. Whitman in revenge.

For a number of years Mr. Reynolds was a guide to the Yellowstone Park regions and he knew that country and Montana perfectly. He acted as Hayden's guide in his survey of the Park and told anecdotes of Hayden. During one of the last, probably the last Indian trouble in that region, he and three others were attacked in the Park by the Nez Perces. He owed

his life to a slight incident. He had been leading the party all day, but on coming to where the trail forked his companions insisted on taking the road to the right, while he wished to turn to the left. They started on without him and were some distance ahead when the Indians fired upon them and the three companions were killed. His horse was shot from under him, and in falling on him crushed his left leg. He then crawled to a rocky ledge and defended himself until dark, then crawled to the road, and with the aid of a stick made his way back to the ranch-house which he found in flames. He remained in hiding for a time, then found eggs and potatoes for food. Meantime the broken leg had swollen and become very painful. The next morning he saw a cloud of dust and supposed a band of Indians to be coming. He started toward the rocky ledge lining the Yellowstone determined to sell his life as dearly as possible, when he discovered the dust to be caused by a band of soldiers under General Steptoe—he was not quite positive of this name—but, wounded as he was, he was taken along to guide the soldiers in the pursuit of the Indians, while an army surgeon gave such relief as was possible.

Mr. Reynolds also accompanied and aided Captain Drannan in the recapture of Olive Oatman who had been captured by the Mohave Indians. He was also one ef the party of English and Americans who surveyed the northwest boundry of the United States. At the time of the Custer massacre he and five companions were prospecting on a mountain near the battle and heard the firing. Next day he and a man named Clark came down the mountain and found Custer and the dead soldiers. He had known Custer and recognized him at once. He and Clark then met Reno and guided him to the scene of Custer's death.

Mr. Reynolds stated that in all his travels he has never found an Indian tribe without its Catholic priest. He is now almost seventy-six years old and feels that his usefulness is past. In his own words, "he is too sore and stiff to travel as he would like to do." When we left him on the following morning he told us all about the country we expected to visit and gave us explicit directions. On showing him a Rand-

McNally map of the country, and asking him to mark out the road on that he said: "Oh, put that away! Do you know how them maps are made? Some eastern college fellows come out here and they travel along until they come to a stream. After they cross it they dismount and say, 'what is the name of this river?' Then they sit down and draw a crooked line the way they imagine it flows and call that a map of the country. If they find a stream that has no name they give it their own and go on." No one in that country used maps and we soon discarded our own, for we found that in this matter, at least, Mr. Reynolds was right. No map that we have seen correctly portrays Routt County.

We have related these stories as they were written that evening in our notes, and the reader of history may prove them true or false. Prosperity has smiled sufficiently upon Mr. Reynolds that he might spend the last days of his life in town and in comfort, but the romance of his life made him a wanderer, and he will draw his parting breath among the mountains and away from the common paths of men. He sat on the porch of that little cabin and waved us a farewell, then turned to look out upon the mountains where more than a hundred head of fine horses which he owned were grazing. We saw him again on our return, and he smiled a smile of satisfaction when we told him that we had found everything as he had said in the country beyond. We again bade him farewell, regretting that we could not learn more of his eventful life and give something of his knowledge to the historians. Many times since then my mind has gone back to that lonely figure with its head bowed at times over a cane, yet erect and straight as the northern pine when he stood to bid us God speed. 'Tis a lonely figure in the wilderness, a simple, faithful being upon whom sorrow fell in youth, but failed to embitter and who has traveled on during almost eighty years faithfully doing service on the frontier. I see him now calmly awaiting the summons of the death angel, a pathetic figure about whose mystic life a worthy pen might weave tales equaling those Cooper related of the times when the East was a frontier similar to the one Mr. Reynolds found in the West in his youth.

ENTOMOLOGICAL NEWS.

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PHILADELPHIA, PA., MAY, 1901.

Now is the time that we again think about living insects, and there are certain thoughts that arise in connection with the work of collecting that are very important. When you catch your insects don't put them away in cigar boxes without data and depend on your memory to supply the facts when you wish to use the specimens. The chances are that when you next open the box the specimens will be infested by *Anthrenus* and you will have forgotten the data. Get a supply of pin labels, like those supplied by Mr. Nell, and put one on each pin at once. We are sorry to say there are some entomologists who think a State label is sufficient—we hope for their reformation. Make your papers to contain Lepidoptera symmetrical; cut off the little turnover triangles and always iron the papers before using. If you put pin numbers on your specimens have them very small and preferably printed. We have had specimens sent here with numbers on the pin one inch in length; they had been cut from a calendar. Mount your specimens the same height on the pin, and in the Lepidoptera pin the abdomen on the same plane with the thorax and don't let it sag down any old way and point east or west. Pin the antennæ on the same plane and parallel to the costa and don't have them "boxing the compass." These are small matters but important, so heed them.

Entomological Literature.

COMPILED BY P. P. CALVERT.

Under the above head it is intended to mention papers received at the Academy of Natural Sciences of Philadelphia pertaining to the Entomology of the Americas (North and South). Articles irrelevant to American entomology will not be noted. Contributions to the anatomy, physiology and embryology of insects, however, relating to American or exotic species, will be recorded. The numbers in HEAVY-FACED TYPE refer to the journals, as numbered in the following list, in which the papers are published; * denotes that the paper in question contains descriptions of new North American forms. Titles of all articles in foreign languages are translated into English; usually such articles are written in the same language as the title of the journal containing them, but when such articles are in other languages than English, French, German or Italian, this fact is indicated in brackets.

4. The Canadian Entomologist, London, Ont., April, '01.—**5.** Psyche, Cambridge, Mass., April '01.—**8.** The Entomologist's Monthly Magazine, London, April, '01.—**9.** The Entomologist, London, March, '01.—**12.** Comptes Rendus. L'Academie des Sciences, Paris, '01.—**21.** The Entomologist's Record, London, March 15, '01.—**35.** Annales, Société Entomologique de Belgique, Brussels, '01.—**40.** Societas Entomologica, Zürich-Hottingen, '01.—**58.** Revista Chilena de Historia Natural, Valparaiso, Jan., '01.—**75.** 31st Annual Report, Entomological Society of Ontario, Toronto, '01.—**81.** Biologisches Centralblatt, Erlangen, Mar. 15, '01.—**84.** Insekten-Börse, Leipsic, '01.—**101.** Rovartani Lapok, Budapest, '01.—**104.** Mittheilungen, Naturhistorisches-Museum zu Hamburg, xvii, 2, Beiheft, Dec. 28, '00.—**105.** Videnskabelige Meddelelser fra den naturhistoriske Forening, 1900, Copenhagen.—**146.** The Entomological Student, Philadelphia, April 15, '01.—**148.** Bulletins, New York Agric. Exper. Station, Geneva, N. Y., Dec., '00.—**149.** Anatomischer Anzeiger, Jena, Feb. 23, '01.

THE GENERAL SUBJECT.—B[urr], M. Auguste de Bormans, portrait, **21.—Csiki, E.** On the insectophobos [apparatus for collecting microcoleoptera; in Magyar, German summary], figs., **101,** Feb.—**Gauckler, H.** The new arrangement of the insect collection in the grand-ducal cabinet of natural history at Karlsruhe in Baden, **84,** Mar. 21, 28.—**Imhof, O. E.** Ocelli of insects, **81.—Krecsy, B.** Entomological instruction in America [at Amherst, Mass.; in Magyar], **101,** Feb.—**Lameere, A.** The death of Baron de Selys-Longchamps, **35,** xliv, 13, Feb. 27.—**Lécaillon, A.** On the various cells of the ovary which take part in the formation of the eggs of insects, **12,** Mar. 4.—**Lochhead, W.** Nature study lessons on the squash bug (*Anasa tristis*), figs., **75.—8.** Dr. O. Staudinger [biography, bibliography], portrait, Deutsche Entomologische Zeitschrift, Iris, Dresden, 1901, Zweites Lepidopterologisches Heft, Feb. 20, '01.

ECONOMIC ENTOMOLOGY.—Austen, E. E. The life-history of warble-flies, **8.—Cockerell, T. D. A.** A new plant-louse injuring strawberry plants in Arizona,* **4.—Corbett, E. L.** Spraying:

results of the season, 1900, figs., Bulletin 70, West Virginia Agric. Exper. Station, Morgantown, W. Va., Nov., '00.—**Dearness, J.** A parasite of the San José scale [*Tyroglyphus* sp.], **75.**—**Fielding-Ould, R.** Malaria and its prevention, Nature, London, Mar. 21, '01.—**Fisher, G. E.** et al. San José scale discussion, **75.**—**Fyles, T. W.** Annual address of the President [Insects beneficial to vegetation], **75.**—**Lemaire.** Note on the tsétsé fly, Bulletin, Société royale de Geographie d'Anvers, xxiv, 4, '01.—**Lochhead, W.** A plea for the systematic and economic study of the forest insects of Ontario, figs., **75;** The silkworm industry in Ontario, **75;** The present status of the San José scale in Ontario, **75.**—**v. Röder, V.** On the biology of the fly *Hypoderma bovis* Dec., **84,** Apr. 4.—**Schaufuss, C.** Two Diptera injurious to roses, **84,** Mar. 28.—**Sirrine, F. A.** A little known asparagus pest [*Agromyza simplex* Loew], figs, **148,** No. 189.—**Smith, J. B.** Two strawberry pests, 2 pls., Bulletin 149, New Jersey Agric. Exper. Stations, New Brunswick, N. J., Feb., 27, '01.—**Van Slyke, L. L.,** and **Andrews, W. H.** Report on analyses of Paris Green and other insecticides in 1900, **148,** No. 190.—**Webster, F. M.** Results of some experiments in protecting apples from the attacks of the second brood of codlin moth, **75;** Results of some applications of crude petroleum to orchard trees, **75;** Notes on two longicorn beetles affecting growing nursery stock, figs., **75,** and also in Journal, Columbus Horticultural Society, xv, 4, Columbus, Ohio, Dec., '00; The San José scale problem as compared with the orange scale problem, Science, New York, Mar. 29, '01; Report of the Committee on Entomology [strawberry insects, use of crude petroleum in orchards], 8 pls., Ohio Horticultural Report, 1900. [Place of publication not given].—**Wilcox, E. V.** Abstracts of recent papers, Experiment Station Record, xii, 7, 8, Washington, '01.—**Cox, D. G., Evans, J. D., Fletcher, J., Gregson, P. B., Johnston, J., Lochhead, W., Moffat, J. A., Rennie, R. W.** [Papers on insects of 1900 in Canada, figs.], **75.**

ARACHNIDA.—Dearness, J. See Economic Entomology.—**Peckham, G. W.,** and **E. G.** Spiders of the Phidippus group of the family Attidæ,* 6 pls., Transactions, Wisconsin Academy of Sciences, Arts and Letters, xiii, pt. 1, Madison, '01.—**Pocock, R. I.** The Scottish Silurian scorpion, 1 pl., Quarterly Journal of Microscopical Science, No. 174, London, Mar., '01.—**Rostrup, S.** Greenland Phytoptidæ,* 1 pl. [in Danish], **105.**—**Simon, E.** List of the Arachnida collected by M. C. E. Porter in 1899 at Quilpué and at Molle, and by M. B. Wilson in April, 1900, at Rio Aysen (western Patagonia), **58.**

MYRIOPODA.—Meves, F., and **v. Korff, K.** To knowledge of cell-division in myriopods, 5 figs., 1 pl. Archiv für mikroscopische Anatomie u. Entwicklungsgeschichte, lvii, 3, Bonn, Feb. 25, '01.

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graphic distribution, **12,** Mar. 25, '01.—**Packard, A. S.** Occurrence of *Melanophus extremus* in Northern Labrador, **5.**—**Rehn, J. A. G.** The Linnean genus *Gryllus*, **4.**—**Scudder, S. H.** The species of *Diapheromera* (Phasmidæ) found in the United States and Canada,* **5.**

NEUROPTERA.—Davis, W. T. Additions to our local fauna and flora [Staten Island Lepidoptera, Odonata], Proceedings, Natural Science Association of Staten Island, viii, 3.—**Fyles, T. W.** The dragonflies of the province of Quebec, figs., **75.**—**Hine, J. S.** A review of the Panorpidæ of America north of Mexico, 3 pls. Bulletin of Scientific Laboratories of Denison University, xi, Granville, Ohio, Feb., '01. Also as Ohio State University Bulletin, v, 7, Columbus, O.—**Moffat, J. A.** Parasites in the eggs of *Chrysopa*, figs., **75.**

HEMIPTERA.—Cockerell, T. D. A. Notes on some Coccidæ of the earlier writers, **9;** See also Economic Entomology.*—**Horvath, G.** On the abdominal tubes of plantlice [as means of defense; in Magyar, German summary], **101,** Feb.—**King, G. B.** *Lecanium Websteri* Ckll. and King, n. sp., with notes on allied forms,* **4.**—**Newstead, R.** Observations on Coccidæ, No. 19, figs., **8.**—**Reed, E. C.** Synopsis of the Hemiptera of Chile (cont.), **58.**

COLEOPTERA.—Barrett, O. W. See Lepidoptera.—**Belon, Pere.** The genus *Cortilena* Motsch. (Lathridiidæ) and synopsis of the species now known, **35,** xlv, 2, Mar. 23.—**Dury, C.** A new Calandrid from Cincinnati, Ohio,* fig., Journal, Cincinnati Society of Natural History, xix, 8, Mar. 27, '01.—**Fenyes, B.** A giant Bostrychid [*Dinapate Wrightii*; in Magyar], **101,** January.—**Fliche, P.** On a fossil insect [Coleopter] found in the Trias of Lorraine, **12,** Mar. 11.—**Gregson, P. B.** Habits of the larvæ of *Dermestes talpinus* (Mann.), figs., **75.**—**Jacobson, G.** Interesting case of mimicry among Russian Coleoptera [in Russian], Annuaire, Musée Zoologique de l'Academie Imperiale des Sciences de St. Petersbourg, 1900, v, 4.—**Knaus, W.** Collecting notes on Kansas Coleoptera, ii, **4.**—**Müller, J.** Contribution to knowledge of cave Silphidæ, 1 pl., Verhandlungen, k. k. Zoologisch-botanischen Gesellschaft in Wien, li, 1, Feb. 25, '01.—**Pic, M.** Diagnoses of exotic Anthicidæ,* **35,** xlv, 2, Mar. 23; New Coleoptera of the Hamburg Museum, **104.**—**Rengel, C.** On the biology of *Hydrophilus piceus*, **81.**—**Schenkling, S.** New Cleridæ of the Hamburg Museum,* **104.**—**Webster, F. M.** Observations on several species of Dermestidæ, **75.**—**Wickham, H. F.** Cicindelidæ at artificial lights, **146.**

DIPTERA.—Austen, E. E. See Economic Entomology.—**Chagnon, G.** Preliminary studies on the Syrphidæ of the province of Quebec, Naturaliste Canadien, Chicoutimi, Quebec, March, '01.—**Christophers, S. R.** The anatomy and histology of the adult female mosquito [*Culex* and *Anopheles*], 6 pls., Reports to the Malaria Committee of the Royal Society, 4th series, London, March 30, '01.—**Coquillett, D. W.** New Diptera in the U. S. National Museum,* Proceedings, United States National Museum, No. 1225, Washington, '01.—**v. Kertesz, K.** Spin-

ning Diptera [in Magyar, German summary], **101,** Feb.—**Lundbeck, W.** Diptera grœnlandica* [in Danish, diagnoses of new species in Latin], **105.**—**Packard, A. S.** Occurrence of *Anopheles quadrimaculatus* in Maine, **5.**—**v. Röder, V.** See Economic Entomology.

LEPIDOPTERA.—**Bachmetjew, P.** Why do the diurnal Lepidoptera fly only during the day and most nocturnal ones in the night? **40,** Feb. 15.—**Barrett, O. W.** Stray notes [Lep., Col.], **146.**—**Chapman, T. A.** Notes on Luffias, with incidental remarks on the phenomenon of parthenogenesis, **21.**—**Cockerell, T. D. A.** Lepidoptera: Some insects of the Hudsonian zone in New Mexico, iv, **5.**—**Davis, W. T.** See Neuroptera.—**Dognin, P.** Description of new Lepidoptera, Le Naturaliste, Paris, March 15, '01.—**Dyar, H. G.** On certain identifications in the genus *Acronycta*, **4**; Life histories of North American Geometridæ, xxi, **5.**—**Fletcher, J.** [Notes on some Canadian Lepidoptera], **75.**—**Gibson, A.** The breeding of Lepidoptera, with notes on the inflation of larvæ, **75.**—**Green, E. E.** Moth catching by electric light at the Boer camp, Diyatalawa, Ceylon, **8.**—**Grote, A. R.** Systematic arrangement of the North American Lepidoptera, **4.**—**Hall, F. J.** Notes on the Noctuid group Dicopinæ of Kansas City, Missouri, **146.**—**Heath, E. F.** Notes on the occurrence of Lepidoptera, etc., in southern Manitoba, **4.**—**Heylaerts, F. J. M.** Description of an unpublished Psychid from Argentine Republic, *Chalia Künckeli*, **35,** xlv, 2, Mar. 23.—**Kusnezow, N.** On the protective coloration and attitude of *Libythea celtis* Esp., fig., Horae Societatis Entomologicae Rossicae, xxxv, St. Petersbourg, Nov., '00.—**Lyman, H. H.** Notes on Walker's types of *Spilosoma congrua*, and a few other types in the British Museum, **4.**—**Marshall, G. A. K.** On the female pouch in *Acræa*, **9.**—**McIntosh, W.** The hawk and bombycine moths of New Brunswick, introductory list, Bulletin, Natural History Society of New Brunswick, iv, 4, St. John, '01.—**Moffat, J. A.** *Anosia archippus* yet again, fig., **75.**—**Nash, C. W.** Notes on *Danias archippus*, **75.**—**Pagenstecher, A.** Libytheidæ, 4 figs., Das Tierreich, 14 Lieferung, Berlin, Feb., '01.—**Slevogt, B.** Are *Arctia caja* and other brightly colored Lepidoptera eaten by birds? **40,** Mar. 15.—**Standfuss, M.** Synopsis of experiments in hybridization and temperature made with Lepidoptera up to the end of 1898, **9.**—**Tutt, J. W.** Migration and dispersal of insects: Lepidoptera, **21.**

HYMENOPTERA.—**Ashmead, W. H.** Hymenoptera: Some insects of the Hudsonian zone in New Mexico, iv*, **5.**—**Cockerell, T. D. A.** The bee genus *Dioxys* in America, **146.**—**v. Dalla Torre, K. W.** A couple of nomenclatural remarks on the group Ichneumoninæ of W. H. Ashmead's 'Classification of the Ichneumon Flies,' etc., of 1900. Wiener Entomologische Zeitung, xx, 3, Mar. 10, '01.—**Dickel, F.** My views on the results of the Freiburg researches on bees' eggs; Facts decide, not views (two papers), **149.**—**Emery, C.** Notes on the subfamilies Dorylinæ and Ponerinæ, **35,** xlv, 1, Mar. 7.—**Morice, F. D.,**

and **Cockerell, T. D. A.** The American bees of the genus *Andrena* described by F. Smith, **4.—Observer.** How do bees manage to survive the winter? British Bee Journal, London, March 7, '01.—**Plateau, F.** Observations on the phenomena of constancy in some Hymenoptera, **35,** xlv, 2, March 23.—**Prowazek, S.** Observations on ants [senses of], Der Zoologische Garten, Frankfurt a. M., Feb., '01.—**Rudow.** Some observations on insect buildings, **84,** Mar. 7.—**Weissmann, A.** Remarks on Herr Dickel's article [see *ante*], **149**

DEPARTMENT OF ECONOMIC ENTOMOLOGY

Edited by Prof. JOHN B. SMITH, Sc. D., New Brunswick, N. J.

Papers for this department are solicited. They should be sent to the editor Prof. John B. Smith, Sc.D., New Brunswick, N. J.

SOME NOTES ON THE LARVAL HABITS OF CULEX PUNGENS.

BY J. B. SMITH, SC.D.

New Jersey's reputation for mosquitoes is well established, and more people come into our State annually to be bitten by our shore species than go to any other State in the Union for any like purpose. In some of the swampy districts in the pines they make life a burden at times, so when my good friend J. Turner Brakeley wrote me in the late summer that, in looking at the contents of some pitcher plant leaves he had found mosquito larvæ in abundance in the water they contained, it made no especial impression upon me. It was in a way what I would have expected, though no one had noted this, so far as I could then remember. Dr. Riley at one time bred a number of species from this plant; but seems either to have found no mosquitoes or to have ignored them. Mrs. Treat made many interesting observations on the feeding habits of the plant itself, feeding the leaves with raw meet in place of the insects that ordinarily fall into them; but she also ignored the mosquitoes.

Late in November I spent three days with Mr. Brakeley at Lahaway, and one of our walks was into a huckleberry and wild cranberry swamp where pitcher plants were abundant. Though the weather was yet quite mild, mosquitoes were no longer obtrusive. There were occasional specimens to be sure, but they seemed to be left-overs not yet in hibernating quarters. The interesting point was that in every leaf examined there were wrigglers varying in size from an eighth to a quarter of an inch in length. There was always a mass of insect fragments at the bottom, say from one-half to an inch in depth, and in composition this varied from a dense black ooze at the lowest point to entire or only partly decayed specimens at the top of the mass. The question arose at once whether these larvæ would yet develope that season, and from published accounts

I assumed that they must or perish. Dr. Howard in his careful account of the species of *Culex*, and especially *pungens*, says nothing of larval hibernation. He records finding adults, and, indeed, this was in accordance with my own experience.

The matter dropped here until late in January, when, during a bitter cold spell, Mr. Brakeley cut out a few pitcher leaves, stripped them from the core of solid ice they contained, and looking through saw wrigglers imbedded in all parts of it, in all sorts of shapes, but mostly in a half coil. The temperature of the bog had been down to 2° below zero, as registered by a standard minimum thermometer, and radiation probably lowered this even more.

A number of leaves were gathered, the cores of ice with all they contained were removed and the lumps were placed together in a jar in a moderately warm room. The ice melted slowly, and as the larvæ were gradually freed they dropped to the bottom where for a time they rested, apparently lifeless. But as the amount of ice decreased, feeble motions here and there indicated a revival, and long before the lumps were completely melted, those first released were moving about actively. This be it noted was in water not much above the freezing point. Soon after the ice had melted and the debris had settled, the insects were busily engaged in apparent feeding.

The specimens were sent to me as a curiosity January 22d, and arrived in very good condition. A few had succumbed to the dangers of the journey, but altogether there was a good lot of lively wrigglers. The bottle was nearly full of water; it had had a five mile wagon drive over a rough road, had been transhipped no less than four times before it reached New Brunswick, and was thrown into the delivery wagon. Any regular breathing under these circumstances, of the kind usually described, was utterly out of the question, and drownings should have been numerous; but really only a very small number of specimens died.

At short intervals other jars were received, all of melted ice taken from pitcher plants, until I had several hundred active wrigglers in eight different jars. Some of the leaf chunks, Mr. Brakeley informs me, had only a very few larvæ—ten or a dozen; others ran as high as thirty or more.

The jars were all placed on a counter shelf near a steam radiator, and it was expected that in a few days there would be pupæ and adults. But the days passed into weeks and the weeks into months, without change, other than a gradual—a very gradual—increase in size. The larvæ were just as active and lively as they could be expected to be, and were feeding continuously; but evidently something was lacking. Besides, they did not in all respects behave as, according to Dr. Howard's account, they should have done. I do not suggest that the account as printed is not a perfectly accurate record of facts: merely that my specimens were Jersey mosquitoes and therefore a law unto themselves.

As the fragments settled to the bottom the water became almost entirely clear, the larvæ congregated over this sediment, feeding head down

and frequently rooting into it: varying the process by working along the glass of the jar on the side away from the light. It was very rare that an individual was observed at the surface with the spiracle in breathing position. I watched patiently several times 15 minutes at a time without noting a single individual rising to the top. Mr. Dickerson, one of the students, watched more or less continuously for two hours on one day and declared positively that during that period only a small percentage of the entire number came to the top. On two or three occasions, where my work was such as to allow it, I kept a jar within sight the entire day, and I have no hesitation in saying that some individuals remained below the surface for hours.

Occasionally a number of specimens would be at the surface, feeding, head up, so that the mouth brushes skimmed the surface, and these were watched on occasions for fully 20 minutes without noting any attempt to assume the breathing position. In fact, during the two months that these larvæ were under daily observation, the rising to the surface to breathe was the rare exception rather than the rule.

As to feeding positions, all of those figured by Dr. Howard were noted. Usually they were head down over the bottom sediment or head up, feeding along the sides of the glass or at the top. The mouth brushes serve as organs of locomotion as well as for feeding, and the insects are perfectly able to make their way from place to place without moving any other part of the body.

The jerky, wriggling motion is used when they wish to get away quickly, and as often to get down to the bottom as to get up to the surface. They can and often do sink slowly to the bottom without any motion whatever, and often to sink more rapidly, they curl themselves up into a ring. Occasionally a specimen will get hold of a bubble of gas forming at the bottom and will allow itself to be floated to the surface. It is immensely interesting to watch these little creatures; but as week after week went by without change, it became just a little tedious. To hasten matters a little, on March 1st I placed the two jars first received on a water bath which was kept at a temperature as nearly constant as the varying gas pressure allowed. Ordinarily the thermometer ranged between 100° and 110°, but it has gotten as high as 120° and as low as 90°. These were exceptions, however, and not exceeding the ordinary out-door range in June. The temperature of the water in the jars ranged between 80 and 90 almost uniformly.

A difference in the rate of growth was observable after a few days, and several specimens seemed approaching the adult condition; finally, March 18th, I noted the first pupa, 17 days after placing the jar on the water bath. From this the adult emerged March 21st and proved to be a female *C. pungens*. Three other pupæ were formed within a week after the first, and a second adult, also a female, was obtained March 24th.

As to the habits of the larvæ in the two jars artificially forced, there was little to note as different from those in the normal laboratory temperature

which varied from 40° to 78°, averaging a little under 70° for the 24 hours. They fed in much the same manner, kept away from the light as much as possible, passed most of their time at the bottom, but were more lively and more frequently at the surface. The jars were kept covered, except for a few minutes each day, and in none of them did the water foul, despite the vegetable and animal matter present in each.

March 24th I made an experiment that resulted fatally. It occurred to me that possibly the slow growth was due to lack of food, and Mr. Brakeley had written me that the wrigglers attacked and devoured a small gnat which was breeding in his jars, suggesting that possibly a mutton chop might help matters along.

March 24th I put a small lump of raw beef, chopped fine, into each of the five experiment jars. Next day I could give only a casual glance before going out of town and this showed nothing unusual; but the day after, March 26th, when I reached the laboratory at 8 A.M., I saw at once that something was wrong, because all the living larvæ were at the surface, head down, spiracle reaching the air. In every jar into which I had placed the meat I noted the same appearance, and I hastily fished out every particle. But it was too late: more than half were already dead, others seemed to show a fungoid growth proceeding from the segments so, to prevent their dying, I killed them off with a dose of formalin. One large jar received in February was left unharmed, and this was placed on the water bath March 26th. Nothing has come from it at the date of present writing, and nothing may ever come from it; but its history must be written later.

But this experiment, fatal as it proved, was of some value. It shows that water too foul with animal decay is not suitable for mosquito larvæ. Vegetable decay, and the harder refuse from insect bodies, will help along the development; but beyond that, the water must be clean. It seems to indicate further that the condition of the water may very largely determine the frequency with which the supply of oxygen must be renewed from above the surface. In June, with a supply of water at a relatively high temperature, in which microscopic life is swarming, I have no doubt Dr. Howard's observations would be exactly duplicated. With the same species in clean water, at a relatively low temperature, the breathing habits are quite different, and the insects obtain, I have no doubt, a goodly portion of their oxygen from the water itself. Just how they do this I am not prepared to say. One thing may be considered as certainly established by this series of observations: the insect can and does hibernate in the larval stage, if this is not, indeed, the prevailing method. Mr. Brakeley scoured the swamps for miles about within the last few weeks, and wherever he found pitcher plants, almost or quite every leaf had its supply of wrigglers. It is not, therefore, a local phenomena. Nor is it even suggested that pitcher plants alone furnish breeding places where the larvæ hibernate; but they are remarkably safe resorts protected to a very marked extent from natural enemies. Is there

any relation between plant and insect whereby the plant receives a benefit? Do the wrigglers in any way prevent a foulness of the water from the insect fragment until the plant has absorbed what it needs?

It is noticeable that during the whole winter only a single example of *Culex pungens* was taken in the barns, storehouses or cranberry sorting rooms, though they were diligently sought.

Anopheles punctipennis were found quite abundantly, between 20 and 30 specimens having been taken on the windows of the sorting rooms; but no *Anopheles* larvæ were found in any of the collected leaves. As a Jerseyman, Mr. Brakeley ordinarily pays little attention to mosquitoes, but he could not easily overlook *Anopheles* did it occur in any numbers in summer. He says it does not, and that he has never seen as many during his years of residence in the pines, as he did this past winter.

My own experience is similar: I remember that about three years ago I was annoyed by *Anopheles* very early in the year in my store room in the basement of the station building. Later on I saw nothing of them, and I can say positively that the species of this genus form no part of the often considerable swarms in and near New Brunswick.

In the cellar of my residence I took *Culex pungens*, female, March 22nd, flying. It could not well have developed there, and, of course, there can be no doubt that the species hibernates as an adult as well as in the larval stage.

These pitcher plant leaves contain, besides mosquito larvæ, considerable numbers of long, white, worm-like larvæ which Mr. Brakeley succeeded in breeding. Some examples submitted to Mr. C. W. Johnson he pronounced to be *Aedes fuscus* O. S.,* a species by no means commonly observed.

The present series of notes are not by any means a complete record of the observations made on the wriggler colonies at New Brunswick and in the pines and they are not even ended; but they will serve to call attention to one or two heretofore unobserved facts. They also contain a suggestion: Is it not probable that the mosquitoes that swarm in Alaska and Arctic regions may pass the winter in the larval stage, frozen in the solid ice, ready, when the melting times comes, to mature rapidly.

Hiding places for adults are occasionally somewhat scant in such regions, and the swarms are said to be even more numerous and vicious than they are in New Jersey.

MR. S. T. KEMP, of Elizabeth, N. J., has started for Arizona, where he will spend six months in collecting insects. We wish him much success.

MR. W. F. FISKE severed his connection with the Experimental Station at Durham, N. H., to accept the position of Assistant State Entomologist of Georgia. His new address will therefore be Atlanta, Ga.

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* Later examples bred were *Chironomus* sp., hence at least one other species breeds in these plants.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

A CORRECTION.—In my notice of the life of Baron Edmond de Selys-Longchamps, in the February NEWS, I stated (p. 34) that "He studied in the University of Liegé." The authority for this assertion was Vapereau's *Dictionnaire Universel des Contemporaines*, sixth edition, Paris, 1893, p. 1431. It now appears that this is an error, for M. le Baron Walter de Selys has written to me "mon père n'a jamais fait d'études universitaires." Mr. McLachlan has correctly stated the case in his notice of the deceased in the Entomologist's Monthly Magazine for March.—PHILIP P. CALVERT.

SOME time ago a box of insects came to me. They were pinned in a rather heavy cigar box, lined with agave pith. The cigar box measured 8 inches in length, 2¼ in depth and 5¼ inches wide. This box was enclosed in an outer wooden box measuring 9¾ inches long, 4⅜ inches deep and 6⅛ inches wide. Six ounces of cotton were put between the boxes. Package came by express with nothing but the address on the box. What was the condition of the enclosed insects? If injured, why were they injured? If there were any mistakes made in the packing, what were they? We will publish the best answer in the June NEWS.—HENRY SKINNER.

Sphæridium scarabæoides Linn.—On page 73 of the Classification of Coleoptera, by Messrs. LeConte and Horn, 1883, there is a foot-note relating to the species which states that "an European specimen has been found in Canada, but that it was undoubtedly introduced and accidental in occurrence."

Under the division of the tribe, the text reads, except *Sphæridium*, all the known genera of this tribe have been found in the United States."

I order to correct these statements, I would like to place on record the finding of this species in the Catskill Mountains of New York during the latter part of July, 1900, in considerable numbers under fresh cow droppings; some being taken on *copula*. It would seem that is is thoroughly established in that locality, for some years ago I also took a single specimen. While the species is included in Henshaw's List (No. 1662), I do not know of any previous record of its occurrence within the limits of the United States.—R. F. PEARSALL.

GREATER NEW YORK, with the assistance of lesser New Jersey, managed to get together about sixteen entomologists to take part in a bug-dinner on the 17th inst. The attraction was great, or the attendance would not have rivalled previous occasions on the 4th of July at Jamesburg. But it was all due to the irresistable collection-collation called Bill of Fare. Some of the tid-bits mentioned were San José Scale on the

Half-Shell; Broiled Pupæ in Case; Ox Bot Soup; Baked *Belostoma; Blattis* Roe; Roast *Dynastes*, stuffed with Apple Worms; Fried *Regalis* Larvæ, horns removed; *Cicada* Steak, with New Mushroom Sauce; Galls Sens Lat; Drawn *Sphinx* Tongues, braided; Pickeled Lady Birds Feet; American All-Alive Cheese; Imported *Canthon* Pellets; Fungus Pie, Staphylinid Dressing; *Cychrus* Knuckles; Mud Wasp's Nests, with Jiggadobber Jelly; Extract de *Cimex;* Beer a la *Brachynus;* Pink *Antiopa* Milk; Sparkling Double-distilled Jersey Lightning (Bugs), bottled at Jamesburg under the supervision of the State Entomologist. Flies on the members were carefully removed by the waiters who secured a bushel. Cyanide, Chloroform, Sulphuric, Ether, Benzine, Naphthaline, Le Page's Glue and Bisulphide of Carbon were on tap. Other dainties, too numerous to mention, were served. Plasters of *Cantharis vesicatoria* were supplied to all needing them. It is hoped that the hilarious time at this this dinner will induce a greater attendance next year.

Doings of Societies.

A meeting of the Feldman Collecting Social was held April 17th, at the residence of Mr. H. W. Wenzel, 1523 S. 13th St. Eleven members present.

Mr. Bœrner read a letter which he had received from our fellow-member, Mr. Philip Laurent, who is at Enterprise, Florida, and he stated that the locality where Dr. Castle and he had collected the last time they were there had been burnt over and the collecting was very poor. On behalf of Mr. Laurent, Mr. Bœrner presented each member with a beautiful souvenir from Miami, Florida.

Mr. Wenzel spoke upon and exhibited the Pselaphid *Bryaxis luniger* taken at Anglesea, New Jersey, and *Nisaxis tomentosa* also found at Anglesea, which he had previously received from Florida. From the manner in which some of the Pselaphids are found they might be called subaquatic. In speaking of the difference in sexes he said that in *B. luniger* the males outnumbered the females, while in *N. abdominalis* the females outnumbered the males. He showed some work done by a species of *Scolytus* in the woody fibre of the sumach which he had found at Frankford, Pa.

Dr. Skinner spoke upon the preservation of insects from pests, and in twenty years' experience had found that the case which contains the drawers, or boxes, was a very important

factor. He did not think that a wooden case was the proper thing to use on account of the quantity of dust which collects and works its way into the interior, and suggested that a case made of tinned iron, like those used by ornithologists, would be the best. This would do away with the dust question and also the poisons which are now used. Dr. Skinner also stated that *Anthrenus varius* was the commonest pest in collections in this locality.

The question of destroying household pests was discussed by Dr. Skinner, who said that a very simple way to destroy the ants, beetles, larvæ, etc., was to melt naphthaline and pour it in the cracks, surbase, carpet or other places where the insects hide. Mr. Wenzel suggested that parafine or wax would be better because it would not evaporate.

Dr. Skinner stated that wax or parafine would not do for carpet on account of non-evaporation.

WM. R. REINICK, *Secretary.*

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held March 28th. Mr. H. W. Wenzel Vice-Director presided. Eleven persons were present. Mr. C. W. Johnson exhibited some pith (or fungus) which had caused the ends of minuten nadeln to disintegrate and allow the specimens to drop in the box. He said either moisture or an acid in the material had caused the trouble. The specimens came from Budapest, and Mr. Wenzel asked if the sea voyage might not have caused a dampness in the pith. Mr. Johnson also exhibited specimens of *Anopheles quadrimaculatus* and *punctipennis;* also *Ædes fuscus* raised from pitcher plants by Prof. Smith. He had also received *Ædes sapphirinis* from Dr. Woldert, taken at the Philadelphia Neck. The difference in the palpi of the genera of mosquitoes was mentioned. Mr. Bradley exhibited an unique box for mailing insects which had been devised in France. The inner box in cork and the outer box is padded on the inside. He also exhibited living young of *Tenodera sinensis.* J. A. G. Rehn, H. D. Viereck and W. S. Huntington were elected associates.

HENRY SKINNER, *Recorder.*